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14. ABSTRACT Throughout the history of warfare, adversaries have regularly attempted to deny one another freedom of movement on the battlefield. Past forms of “anti-access” served to both protect friendly forces and prevent enemies from gaining positions of advantage. As expeditionary warfighters, American forces have come to depend on safe deployment into theater and the ability to gain and maintain air, space and maritime superiority. China, however, has emerged as a regional power with robust anti-access/area denial (A2/AD) capabilities designed to disrupt U.S. power projection in the western Pacific. To ensure U.S. military freedom of movement and action in the vicinity of Taiwan, the Commander, U.S. Pacific Command (CDRUSPACOM) must address Chinese A2/AD as a new way of war, comprehend the associated operational implications, and eliminate any imbalance between the military objective and the means by which to achieve it.					
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**NAVAL WAR COLLEGE
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**Chinese Anti-Access/Area Denial:
The Evolution of Warfare in the Western Pacific**

by

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Major, USAF

**A paper submitted to the Faculty of the Naval War College in partial satisfaction of the
requirements of the Department of Joint Military Operations.**

**The contents of this paper reflect my own personal views and are not necessarily
endorsed by the Naval War College or the Department of the Navy.**

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Abstract

Throughout the history of warfare, adversaries have regularly attempted to deny one another freedom of movement on the battlefield. Past forms of “anti-access” served to both protect friendly forces and prevent enemies from gaining positions of advantage. As expeditionary warfighters, American forces have come to depend on safe deployment into theater and the ability to gain and maintain air, space and maritime superiority. China, however, has emerged as a regional power with robust anti-access/area denial (A2/AD) capabilities designed to disrupt U.S. power projection into the western Pacific. To ensure U.S. military freedom of movement and action in the vicinity of Taiwan, the Commander, U.S. Pacific Command (CDRUSPACOM) must address Chinese A2/AD as a new way of war, comprehend the associated operational implications, and eliminate any imbalance between the military objective and the means by which to achieve it.

INTRODUCTION

Throughout the history of warfare, adversaries have regularly attempted to deny one another freedom of movement on the battlefield. From the Great Wall of China to the Maginot Line, past forms of “anti-access” served to both protect friendly forces and prevent enemies from gaining positions of advantage. Time and ingenuity, however, often revealed vulnerabilities in these traditionally defensive measures. In 1940, German Panzer divisions used the combination of technology, speed and maneuver to avoid the strength of the Maginot Line and penetrate French defenses.¹ Allied forces eventually developed the weapons and tactics necessary to mitigate the effects of Blitzkrieg, but were largely caught off guard and unprepared for this new style of warfare.²

By the early 1990’s, U.S. research identified information, space, sea, and air denial as likely goals of emerging global competitors in efforts to deny U.S. ability to sufficiently project military power.³ Follow on studies postulated that future adversaries would likely be able to disrupt U.S. force deployment and deny access to contested regions.⁴ In 2003, the Center for Strategic and Budgetary Assessments (CSBA) defined anti-access as enemy actions which inhibit military movement into a theater of operations, and area-denial

¹ Robert A Doughty, *The Breaking Point: Sedan and the Fall of France, 1940*. (Hamden, CT: The Shoe String Press, 1990), 7.

² Ibid.

³ Andrew F. Krepinevich, *The Military-Technical Revolution: A Preliminary Assessment*. (CSBA, 2002), 1.

⁴ U.S. Department of Defense, *Report of the Defense Science Board Task Force on Strategic Mobility*. (Washington, DC: DoD, August 1996), 3, and U.S. Department of Defense, *Report of the National Defense Panel*, (Washington DC: DoD, December 1997), 1.

operations as activities that seek to deny freedom of action within areas under the enemy's control.⁵

Today, China has emerged as a regional power with robust Anti-Access/Area Denial (A2/AD) capabilities and unclear political and military intentions. Chinese anti-access capacity includes a large ballistic missile force designed to attack key point targets, such as air bases and naval facilities. Chinese area denial capabilities consist of advanced counter-maritime and counter-air systems designed to destroy critical mobile assets, such as surface ships and aircraft. A2/AD also extends into the space and cyber domains that support U.S. operations, and is specifically designed to disrupt U.S. power projection.⁶ Furthermore, Chinese A2/AD is particularly well suited for use against U.S. forces in the event of a confrontation over the defense of Taiwan.

As expeditionary warfighters, American forces have come to depend on safe deployment into theater and the ability to gain and maintain air, space and maritime superiority, and have not been significantly challenged in any of these domains since the Vietnam War. Much like the German Blitzkrieg of 1940, however, A2/AD capabilities have once again changed the character of warfare, and present significant challenges to U.S. military freedom of movement and maneuver in the western Pacific. In order to defend Taiwan against Chinese aggression, the Commander, U.S. Pacific Command (CDRUSPACOM) must address Chinese A2/AD as a new way of war, comprehend the associated operational implications, and eliminate any imbalance between the military objective and the means by which to achieve it.

⁵ Andrew F. Krepinevich et al., *Meeting the Anti-Access and Area Denial Challenge*, (CSBA, 2003), ii.

⁶ Andrew F. Krepinevich, *Why Air-Sea Battle?*, (CSBA, 2010), 13.

OPERATIONAL IMPLICATIONS OF CHINESE A2/AD

“The success of any major operation or campaign depends on the free movement of one’s forces in the theater. Without the ability to conduct large-scale movements on land, at sea, and in the air, operational warfare is essentially an empty concept.”⁷

-Dr. Milan Vego

Chinese analysis of Operation DESERT STORM observed that one of the key elements of U.S. success was its ability to deploy forces into theater with little risk of hostile interference.⁸ Chinese military leaders concluded that in the event of a war with the United States, the U.S. military deployment process must be disrupted or neutralized. One result of Chinese analysis was the re-emergence of the *Shashoujian* concept, or a method of surprise attack designed to preemptively weaken a powerful enemy.⁹ Modern A2/AD is a contemporary application of *Shashoujian*, and differs from historical iterations of anti-access due to the combination of increased range, accuracy and lethality of China’s advanced, networked weapons systems.¹⁰ Chinese A2/AD not only deters U.S. military deployment into the western Pacific, but also promises to effectively disrupt combat forces operating in the vicinity of Taiwan.

⁷ Milan Vego, “The Factor of Space,” *Joint Operational Warfare*. (Newport, RI: Naval War College, reprint, 2009), III-7.

⁸ Stuart E Johnson and Duncan Long (eds.), *Coping with the Dragon: Essays on PLA Transformation and the U.S. Military*, (Washington DC: Center for Technology and National Security Policy, December 2007), 73.

⁹ Jason E. Bruzdzinski, “Demystifying *Shashoujian*: China’s ‘Assassin’s Mace’ Concept,” in *Civil-Military Change in China: Elites, Institutes, and Ideas after the 16th Party of Congress*, eds. Andrew Scobell and Larry Wortzel (Carlisle, PA: U.S. Army War College Strategic Studies Institute, September 2004), 312-314. <http://www.strategicstudiesinstitute.army.mil/pubs/display.cfm?pubID=413> (accessed 27 April 2010). Often translated as “Assassins” or “Killer’s Mace,” *Shashoujian* is an ancient Chinese term often interpreted to represent a secret, powerful, well practiced skill to use against an adversary with little or no warning.

¹⁰ Christopher Claus (CSAF Strategic Studies Group), telephone call with author, 17 February 2010.

Chinese anti-access capabilities consist of land attack ballistic and cruise missiles which threaten critical U.S. air and naval facilities on the islands of Okinawa and Guam.¹¹ While China already possesses the short and medium range ballistic missile (SRBM/MRBM) forces required to disrupt operations on Okinawa, Japan, recent studies also indicate USAF and USN facilities on Guam are within Chinese ballistic missile range.¹² Without the use of Okinawa facilities in a conflict against China, U.S. operations from Guam are problematic due to long lines of operation and limited number of support facilities on the island. Without Guam, operations become incredibly difficult, and may not be possible due to the distance to Taiwan and logistics limitations of contemporary U.S. military forces.

In addition to land attack forces, China's counter-maritime capabilities also constitute a major A2/AD threat to U.S. sea control in the region. Many of the weapons are strikingly modern, and include a variety of anti-ship ballistic and cruise missiles (ASBM/ASCM) that can also be launched from the air, land or sea. With an estimated range exceeding 800nm, the new DF-21D ASBM may force aircraft carriers to remain beyond distances suitable for efficient air operations, drastically reducing the effectiveness of a Carrier Strike Group (CSG).¹³

The Chinese submarine fleet has also emerged as a credible A2/AD threat, as demonstrated by the 2006 incident in which a Chinese diesel surfaced undetected within lethal firing range of a U.S. aircraft carrier near the southern coast of Japan.¹⁴ With multiple

¹¹ Krepinevich, *Why Air-Sea Battle?*, 13, 17.

¹² Ibid, 13.

¹³ Andrew S. Erickson, "Ballistic Trajectory – China Develops New Anti-ship Missile," *Jane's Intelligence Review*, 4 January 2010.

¹⁴ Washington Times, "China Sub Stalked U.S. Fleet," 13 November 2006.

submarine types employing a variety of anti-ship and land attack weapons, the Chinese undersea force also threatens U.S. access to basing facilities within reach of Taiwan and U.S. freedom of action throughout the western Pacific.

Land attack and counter-maritime forces, while robust, may not even be the most lethal Chinese A2/AD threat to U.S. operations. In the event U.S. forces successfully penetrate the anti-access shield, Chinese area denial assets will prevent U.S. airpower from attaining air superiority to a degree which U.S. forces have become accustomed during recent conflicts. In practically every military operation since 1991, and specifically during Operations IRAQI FREEDOM and ENDURING FREEDOM (OIF/OEF), American air forces have operated largely unmolested in essentially uncontested airspace. This will not be the case against China, as their forces will defend the Taiwan Strait with an advanced integrated air defense system (IADS) and a large number of modern fighter aircraft. The surface-to-air missile (SAM) network consists of several Russian built S-300s and similar indigenously produced variants, many of which can lethally engage aircraft beyond 100 nautical miles (nm).¹⁵

While U.S. 5th generation low observable aircraft such as the F-22A Raptor and B-2 bomber are expected to have inherent advantages against these systems, they are not immune to the threat, and only exist in limited numbers.¹⁶ The majority of U.S. fighters, bombers and cruise missiles are extremely vulnerable to these advanced SAMs, and some experts postulate that strike packages of 4th generation aircraft such as F-15's, F-16's and F/A-18's

¹⁵ Krepinevich, *Why Air-Sea Battle?*, 23.

¹⁶ Ibid, 42,66, Krepinevich, *Why Air-Sea Battle?*, 23, and Geoffrey Church (USAF Air Combat Command), e-mail message to author, 25 November 2009. USAF Air Combat Command reports that current plans are to limit F-22A production to 140 combat capable aircraft.

could experience attrition rates of 20-30% when operating in areas defended by these threats.¹⁷ The combination of the advanced SAMs and fighter aircraft fleet make the Chinese IADS virtually impossible for U.S. forces to penetrate with 4th generation aircraft.¹⁸ Furthermore, recent reports indicate China is expected to either soon acquire or develop “next generation” SAMs that will double Chinese air defense coverage out to over 200nm.¹⁹

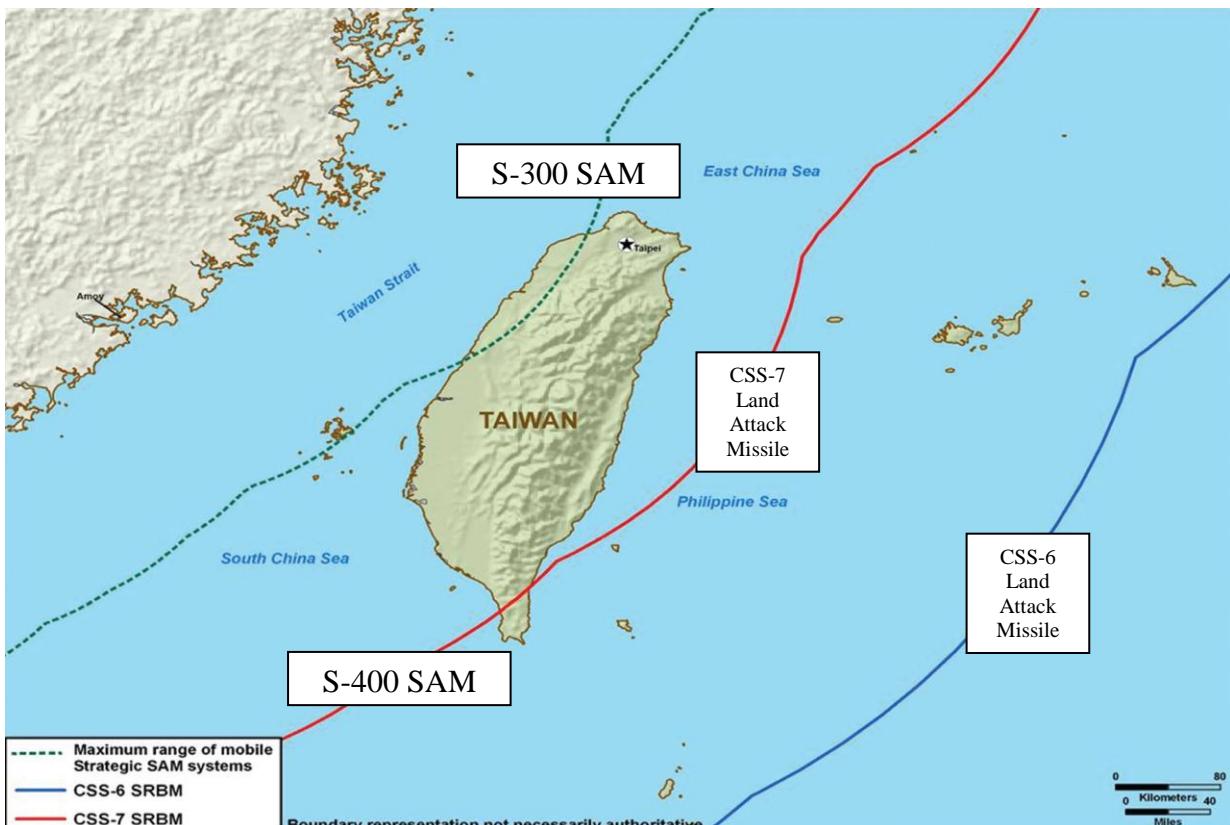


Figure 1. Chinese SAM & Ballistic Missile Coverage in the Vicinity of the Taiwan Strait. This map depicts notional maximum effective ranges of Chinese S-300/400 SAMs and land attack ballistic missiles.²⁰

¹⁷ Abdulla Toukan and Anthony H. Cordesman, *Study on a Possible Israeli Strike on Iran's Nuclear Development Facilities* (Washington, DC: CSIS), 14 March 2009.

¹⁸ Eric Talmadge, *USA Today*. “US Official Notes China’s Military Gains,” 29 September 2007. http://www.usatoday.com/news/world/2007-09-29-3112601973_x.htm (accessed 27 April 2010).

¹⁹ James C. O’Halloran and Christopher F. Foss (eds.), *Jane’s Land Based Air Defence 2008-2009*, 187.

²⁰ U.S. Department of Defense, *Annual Report to Congress: Military Power of the People’s Republic of China*, (2009), 42.

In addition to its significant counter-air and counter-maritime forces, Chinese A2/AD now extends well beyond the traditional domains of air, sea and land. While Chinese cyber attack activities have been well publicized in world-wide news reports over the last several years, anti-satellite weapons now pose a legitimate threat, as demonstrated by China's 2007 shooting down of one of its own inoperative satellites.²¹ Attacks on U.S. cyber and space targets threaten to disrupt or even completely deny multiple enablers of U.S. power projection, including but not limited to satellite communications and Global Positioning System (GPS) based navigation systems.²² One of the most significant implications of A2/AD, however, is China's increased advantage over the U.S in terms of factor time. While China's proximity to Taiwan is already favorable, A2/AD widens the gap by interfering with U.S. military movement into the western Pacific and maneuver within the theater of operations.

BALANCING THE ENDS, WAYS AND MEANS

“Any mismatch or serious imbalance between the objective and the means assigned to accomplish it will invariably lead to failure.”²³
-Milan Vego

The 2010 Quadrennial Defense Review (QDR) states that U.S. forces must be able to project power into anti-access regions in order to “deter, defend against, and defeat aggression by potentially hostile nation states.”²⁴ But in the event of a war with China,

²¹ Krepinevich, *Why Air-Sea Battle?*, 15.

²² Ibid, 16.

²³ Milan Vego, “Military Objectives and the Levels of War,” *Joint Operational Warfare* (Newport, RI: Naval War College, reprint, 2009), II-10-12.

²⁴ U.S. Department of Defense, *QDR Report*, (Washington, DC: DoD, February 2010), 31.

A2/AD could prevent the U.S. from deploying sufficient forces into theater, and would most certainly interfere with the accomplishment of critical objectives necessary for U.S. expeditionary warfare: air, space and maritime superiority. If the U.S. strategic objective is to defeat Chinese forces in order to “preserve Taiwan’s right of peaceful self determination,” then U.S. success could be extremely limited due to the resulting mismatch between the desired end state and U.S. military capability to counter Chinese A2/AD.²⁵ CDRUSPACOM must clearly articulate to the National Command Authority (NCA) these military challenges created by emerging Chinese A2/AD technology and doctrine.

Since war between the U.S. and China would have detrimental impacts for both nations, deterrence remains the preferred option over warfare in the western Pacific.²⁶ But as long as China uses A2/AD capabilities to threaten U.S. freedom of movement and action in the vicinity of Taiwan, cooperation between the two countries will remain a significant challenge. All levels of U.S. government must effectively use strategic communication to de-legitimize Chinese actions in the eyes of the world, while at the same time to influence China to cooperate with all those who share mutual interest in the western Pacific.²⁷ CDRUSPACOM must build and maintain positive relationships with all states in the region and encourage cooperation between Asian nations through a range of diplomatic and military activities designed to foster cooperation and to deter Chinese aggression.²⁸

²⁵ U.S. Naval War College, Joint Military Operations Department, *PRC-Taiwan Vignette*, 2010.

²⁶ Peter Dutton (US Naval War College China Maritime Studies Institute), interview by the author, 17 February 2010.

²⁷ Ibid.

²⁸ Ibid.

In the meantime, the U.S. military has no choice but to prepare for conflict with China, particularly with respect to the defense of Taiwan. One of the first considerations is that of clearly communicating ends, ways, means, as well as cost and risk, both up and down the U.S. military chain of command. PACOM must have a firm understanding of the desired strategic end state, as it may not be clear if the preservation of Taiwan's right of self determination equates to the need for major conventional warfare between the U.S. and China. While successful U.S. combat operations in the western Pacific are certainly possible, the risks to American forces posed by China's A2/AD are significant. Attempts to deploy into theater and to gain air and maritime superiority will likely result in loss of life and materiel to levels not experienced since World War II. Unlike the 1940's, however, the American industrial base is not currently capable of supporting timely mass production of modern fighter aircraft and warships to resupply depleted forces as seen in World War II.²⁹

PACOM planners must thoroughly review U.S. joint doctrine and determine what concepts adequately address operations against an adversary with employing A2/AD technologies. One doctrinal shortfall is that while air, maritime and space superiority are often assumed possible, U.S. forces do not have joint methods for organizing and deploying joint forces to achieve these objectives in areas protected by A2/AD systems.³⁰ The USAF and USN Air-Sea Battle concept under development is expected to provide some original insight into how best to plan for joint operations under these conditions. With anticipated publication in mid-2010, Air-Sea Battle aims to encourage joint planning, training and

²⁹ G.R. Simonson, *The History of the American Aircraft Industry: An Anthology*, 142-143. As one of the largest single industries in the world at the time, the U.S. aircraft industry built 105,000 tactical aircraft between 1941 and 1943.

³⁰ Claus, telephone call with author, 17 February 2010.

deployment to achieve unprecedented levels of integration that will ensure freedom of movement and freedom of action in areas protected by A2/AD.³¹

In order to conduct a new style of U.S. expeditionary warfare that challenges Chinese A2/AD, Air-Sea Battle concepts must improve coordination between air, sea, land, space and cyber assets. One example, according to the USAF Chief of Staff, is that services need to “better integrate their operations centers.”³² Counter-A2/AD planning must also effectively coordinate USAF and USN core competencies to ensure U.S. forces are both realize their maximum potential and identify any capability gaps between the services.³³ While Air-Sea Battle may focus on USAF and USN power projection, PACOM planners must consider the capabilities of all the U.S. armed services to determine how best to maximize U.S. force survivability against A2/AD systems.³⁴

Air-Sea Battle is important because finding alternatives to conventional U.S. military power application is critical to defeating Chinese A2/AD. Traditional methods of deployment and employment incur unacceptable levels of risk, and must be reconsidered. For example, U.S. forces cannot assume unmolested operations out of Kadena and Guam, as facilities on these islands are extremely vulnerable to Chinese attack in a Taiwan defense scenario. Similarly, USN surface combatants can no longer assume safe entry into the western Pacific, as China’s A2/AD forces threaten to neutralize or destroy these high value assets. Furthermore, continuous air, space and maritime superiority, the critical conditions

³¹ Ibid.

³² Christopher P. Cavas, “USAF, U.S. Navy to Expand Cooperation: Air-Sea Will Close Gaps, Boost Strengths,” *Defense News*, 9 November 2009. <http://integrator.hanscom.af.mil/2009/November/11122009/11122009-10.htm> (accessed 30 April 2009).

³³ Ibid.

³⁴ Claus, telephone call with author, 17 February 2010.

necessary for U.S. expeditionary warfare, simply will not exist to the level U.S. forces currently experience in OIF/OEF.

While traditional strongholds like Kadena and Guam are vulnerable to Chinese A2/AD, the successful defense of Taiwan requires U.S. forces to both operate from bases close enough to the operational area to sustain combat operations, and be adequately defended from the A2/AD threat. Past studies have considered air and maritime basing alternatives in the region, but logistical limitations of multiple and austere operating bases may become too cumbersome to sustain.³⁵ In addition, any base within Chinese ballistic missile range is likely to be vulnerable, and will require joint BMD, counter-air and Anti-Submarine Warfare (ASW) capabilities to ensure the protection of land facilities and forces.

In terms of domain control, U.S. military success will require a philosophical shift in what constitutes an acceptable level of air, space and maritime superiority. Current U.S. joint doctrine, supported by U.S. experience since the Vietnam War, essentially assumes that attaining this superiority not only achievable, but is generally required to conduct expeditionary warfare. Gaining superiority across all domains, however, will prove to be a major challenge when U.S. forces are required to operate in areas defended by A2/AD. Temporary, local control of the air and sea is a much more realistic expectation, and may be achieved through focused application of selected principles of war and by balancing operational factors. For example, the massing of selected U.S. forces at a particular time and location will create opportunities to surprise, saturate and overwhelm air defenses, creating a temporary positional advantage in which specific objectives may be achieved. Furthermore,

³⁵ Christopher J. Bowie, *The Anti-Access Threat and Theater Air Bases* (Washington, DC: CSBA, 2002), ii. http://www.csbaonline.org/4Publications/Archive/R.20020924.CSBA_AirBases/R.20020924.CSBA_AirBases.htm (accessed 23 February 2010).

unlike wars of the past, the United States must be completely prepared for both offensive and defensive anti-satellite and cyber warfare, and must be able to effectively operate without these systems.

The strengths of A2/AD may prevent U.S. forces from attacking many Chinese centers of gravity (COGs) directly. However, since China is a large country and area denial weapons are often expensive and limited in number, they are also unable to simultaneously defend multiple decisive points across such a large geographic area. As suggested by JP 3-0, indirect approaches will therefore be critical to U.S. military success. CDRUSPACOM must consider suitable ways to exploit Chinese critical vulnerabilities not protected by A2/AD “to gain leverage over its COGs,” such as attacking command and control facilities and severing lines of communication (LOCs).³⁶ One example of an indirect approach is to attack Chinese merchant shipping and resources transiting the Strait of Malacca. Since 80% of China’s imported oil passes through these waters, the Strait will likely be a decisive point for U.S. and Chinese forces in a western Pacific conflict.³⁷

Though indirect attacks may be operationally effective methods of defending Taiwan, CDRUSPACOM must remain cognizant of risks created by U.S. interdiction of vital Chinese resources and the conduct of strikes against targets inside of mainland China. These actions may result in undesirable strategic consequences for the U.S. by inadvertently increasing the potential for conflict escalation.³⁸ For example, the loss of critical resources or infrastructure

³⁶ Chairman, U.S. Joint Chiefs of Staff, *Joint Operations*. Joint Publication (JP) 3-0, Change 1 (Washington, DC: CJCS, 13 February 2008), IV-12, 13.

³⁷ Mamdouh G. Salameh, *China’s Global Oil Diplomacy: Benign or Hostile?* (Cleveland, OH: International Association for Energy Economics, First Quarter 2010), 22. <http://www.iaee.org/documents/2010WinterEnergyForum.pdf> (accessed 17 April 2010).

³⁸ Milan Vego, “Military Objectives and the Levels of War,” *Joint Operational Warfare* (Newport, RI: Naval War College, reprint, 2009). II-12.

may force China to consider military options it otherwise would not have, such as the use of nuclear weapons in other than a “no first use” basis.³⁹ CDRUSPACOM must therefore seriously consider how U.S. forces can achieve the objective by both utilizing indirect attack methods to avoid A2/AD and minimizing the risk of unintended consequences.

COUNTER ARGUMENTS

Despite the recent, rapid modernization of the Chinese military, there are two reasons to believe that the situation in the western Pacific may not be as dire as it appears. While its military capabilities have drastically improved, China has a host of internal issues preventing it from threatening the U.S. military in the near future.⁴⁰ More importantly, while Chinese A2/AD is a viable threat in the western Pacific, A2/AD does not exclusively represent the face of modern conflict.

Although Chinese military capability is growing impressively, studies suggest three shortfalls that currently prevent China from posing a serious threat to the U.S. military. China’s defense budget is smaller than that of the U.S., and a relatively small percentage of Chinese forces are actually modern.⁴¹ China also faces significant disadvantages in areas of logistics, readiness, training and experience.⁴²

³⁹ Roger Cliff, et al, *Entering the Dragon’s Lair: Chinese Antiaccess Strategies and Their Implications for the United States* (Santa Monica, CA: RAND, 2007). http://www.rand.org/pubs/monographs/2007/RAND_MG524.pdf (accessed 28 January 2010).

⁴⁰ James Fallows, “Cyber Warriors,” *The Atlantic*, March 2010. <http://www.theatlantic.com/magazine/archive/2010/03/cyber-warriors/7917> (accessed 26 March 2010).

⁴¹ Ibid.

⁴² Ibid.

While these arguments may have merit, comparisons of budgets and percentages of modern forces are largely irrelevant metrics when considering the potential effects of A2/AD on U.S. forces. China wisely invested in ballistic missile and SAM technologies specifically designed to counter strengths of the U.S. military. For example, it does not matter that China has not fielded an aircraft carrier while the U.S. has eleven, as Chinese anti-ship missiles are now designed to negate such advantages by preventing the U.S. ships from entering the area of operations.

Chinese logistics, training, and readiness standards, however, may very well be less than those of the United States, and represent a comparable advantage for U.S. forces. Likewise, history indicates that the U.S. military is much more experienced in the conduct of modern combat operations, which also serves as a disadvantage for the Chinese.⁴³ The combination of these factors, however, does not tell the whole story. No amount of U.S. combat experience, for example, will change the fact that the S-300 SAM system can deny the vast majority of U.S. airpower flight over Taiwan.

The importance of addressing A2/AD, however, reaches far beyond the Taiwan Strait. Chinese A2/AD directly influences the balance of power in the South China Sea and throughout the western Pacific, as China continues to use its new military strength to reveal aspirations of regional leadership and global relevance.⁴⁴ In addition, proliferation trends indicate that imbalances created by A2/AD are not limited to China, as fourteen other countries possessed S-300 SAMs as of 2009.⁴⁵ While Iran is not believed to currently

⁴³ Ibid.

⁴⁴ Christopher Claus (CSAF Strategic Studies Group), e-mail message to author, 21 April 2010.

⁴⁵ O'Halloran and Foss, Jane's Land Based Air Defence 2008-2009, 186.

operate the S-300, they have been seeking modern A2/AD technology since the mid-1990s.⁴⁶

Iranian A2/AD assets positioned near the Strait of Hormuz would similarly alter the balance of power in the Middle East by denying other's access to the Persian Gulf, and is just one example of the danger of A2/AD proliferation.

Admittedly, A2/AD is not the only challenge U.S. forces face in the 21st Century, as the character of modern conflict is extraordinarily complex. While not a new concept, many current wars have recently been defined as “hybrid” in character, with adversaries effectively employing elements of regular and irregular warfare.⁴⁷ It is hybrid warfare, not state actors employing A2/AD, that has become the focus of U.S. military efforts since the terrorist attacks of September 11, 2001, and has required creative approaches to address the challenges of fighting insurgents in foreign lands. Additionally, combating irregular warfare has been a top priority of the Department of Defense (DoD) since 2008, and as such, it has driven the majority of contemporary thought on the conduct of operational warfare.⁴⁸

Many of the same experts agree, however, that hybrid warfare is not a replacement of conventional warfare.⁴⁹ A2/AD technologies will, however, serve to amplify the dangers posed by hybrid warfare as anti-access weapons proliferate to state and non-state actors around the world. But while the DoD advocates the need for balance between conventional and irregular capabilities and highlights the need for superior conventional forces, the U.S.

⁴⁶ Anoushiravan Ehteshami, “Iran’s National Strategy Striving for Regional Parity or Supremacy?,” *Jane’s Online* (Vol. 27, Issue 4, 1 April 1994) <http://search.janes.com> (accessed 28 August 2009).

⁴⁷ Robert Wilke, “Hybrid Warfare: Something Old, Not Something New” (Maxwell AFB, AL: *Air and Space Power Journal*, Volume XXIII, No. 4, Winter 2009), 14.

⁴⁸ U.S. Department of Defense, *National Defense Strategy*, (Washington, DC: DoD, June 2008), 13.

⁴⁹ Frank G. Hoffman, “Hybrid Warfare and Challenges,” *Joint Force Quarterly*, No.52, (1st Quarter 2009). <http://smallwarsjournal.com/documents/jfqhoffman.pdf> (accessed 17 April 2009), 38.

military remains ill-prepared to execute combat operations against Chinese A2/AD systems.⁵⁰ A2/AD is therefore the critical underlying theme that defines the evolution of modern combat, whether conventional, irregular or hybrid. As long as U.S. forces remain unprepared to counter A2/AD, the American military will suffer the same fate as that of the French in 1940: military failure due to the inability to comprehend the evolution of modern warfare.⁵¹

CONCLUSION

Just as Blitzkrieg reinvented combat in 1940, anti-access/area denial technologies and strategies have changed the character of modern warfare. Chinese A2/AD undermines contemporary U.S. power projection by denying freedom of movement and freedom of action in and around areas of interest, such as Taiwan and the South China Sea. To successfully defend Taiwan against Chinese aggression, CDRUSPACOM must adequately prepare for this evolution of modern warfare by understanding the operational implications of A2/AD. Planners must use innovative joint planning concepts such as Air-Sea Battle and effective integration of joint forces to help achieve the desired end state with the resources available to the U.S. military. Implications of A2/AD, however, reach far beyond that of conflict in and around the Taiwan Strait. A2/AD not only increases the dangers of conventional war, but also can be utilized by non-state actors worldwide to increase the effectiveness of irregular or hybrid warfare.

⁵⁰ U.S. Department of Defense, *National Defense Strategy*, (Washington, DC: DoD, June 2008), 13.

⁵¹ Williamson Murray and Allan R. Millett (eds.), *Military Innovation in the Interwar Period*, 1996, 34-35.

RECOMMENDATIONS

CDRUSPACOM should consider the following actions to successfully counter the Chinese A2/AD threat in the defense of Taiwan:

- Accept A2/AD as a fundamental change to the character of conventional warfare, as adversaries with A2/AD capabilities can deny freedom of movement and freedom of action across the range of military operations.
- Re-assess joint doctrine relevance to operations against A2/AD threats.
- Ensure U.S. forces have the means to achieve the operational objectives.
- Accept the increased risk operating against A2/AD threats, or change the objective.
- Use Air-Sea Battle innovation as a starting point to integrate command and control between the services, realize the maximum counter A2/AD potential of existing platforms, and identify capability shortfalls that need to be addressed. Participation cannot, however, be limited to USAF and USN – cooperation from other U.S. services and agencies should be encouraged.
- Understand that A2/AD capability is not limited to China, as proliferation is already significant, and challenges U.S. power projection around the world.

BIBLIOGRAPHY

Bowie, Christopher J. *The Anti-Access Threat and Theater Air Bases*. Washington, DC: Center for Strategic and Budgetary Assessments, 2002. http://www.csbaonline.org/4_Publications/Archive/R.20020924.CSBA_AirBases/R.20020924.CSBA_AirBases.htm (accessed 23 February 2010).

Bruzdzinski, Jason E. “Demystifying *Shashoujian*: China’s ‘Assassin’s Mace’ Concept,” In *Civil-Military Change in China: Elites, Institutes, and Ideas after the 16th Party of Congress*, edited by Andrew Scobell and Larry Wortzel, 309-364. Carlisle, PA: U.S. Army War College Strategic Studies Institute, September 2004. <http://www.strategicstudiesinstitute.army.mil/pubs/display.cfm?pubID=413> (accessed 27 April 2010).

Cavas, Christopher P. “USAF, U.S. Navy to Expand Cooperation: Air-Sea Will Close Gaps, Boost Strengths.” *Defense News*. 9 November 2009. <http://integrator.hanscom.af.mil/2009/November/11122009/11122009-10.htm> (accessed 30 April 2009).

Cliff, Roger, Mark Burles, Michael S. Chase, Derek Eaton and Kevin L. Pollpeter. *Entering the Dragon’s Lair: Chinese Antiaccess Strategies and Their Implications for the United States*. Santa Monica, CA: RAND, 2007. http://www.rand.org/pubs/monographs/2007/RAND_MG524.pdf (accessed 28 January 2010).

Doughty, Robert A. *The Breaking Point: Sedan and the Fall of France, 1940*. Hamden, CT: The Shoe String Press, 1990.

Erickson, Andrew S. *Ballistic Trajectory – China Develops New Anti-ship Missile*. Jane’s Intelligence Review. 4 January 2010.

Ehteshami, Anoushiravan. “Iran’s National Strategy Striving for Regional Parity or Supremacy?” *Jane’s Online*, Vol. 27, Issue 4. 1 April 1994 <http://search.janes.com> (accessed 28 August 2009).

Fallows, James. “Cyber Warriors.” *The Atlantic*, March 2010. <http://www.theatlantic.com/magazine/archive/2010/03/cyber-warriors/7917> (accessed 26 March 2010).

Hoffman, Frank G. “Hybrid Warfare and Challenges.” *Joint Force Quarterly*, No.52, (1st Quarter 2009). <http://smallwarsjournal.com/documents/jfqhoffman.pdf> (accessed 17 April 2009).

Johnson, Stuart E. and Duncan Long, eds. *Coping with the Dragon: Essays on PLA Transformation and the U.S. Military*. Washington DC: National Defense University, Center for Technology and National Security Policy, December 2007. http://www.ndu.edu/ctnsp/Dragon_Book.htm (accessed 28 January 2010).

Krepinevich, Andrew, Barry Watts and Robert Work. *Meeting the Anti-Access and Area Denial Challenge*. Washington, DC: Center for Strategic and Budgetary Assessments, 2003. <http://www.csbaonline.org/4Publications/PubLibrary/R.20030520.Meeting the Anti-A/R.20030520.Meeting the Anti-A.pdf> (accessed 28 January 2010).

Krepinevich, Andrew F. *The Military-Technical Revolution: A Preliminary Assessment*. Washington, DC: Center for Strategic and Budgetary Assessments, 2002. <http://www.csbaonline.org/4Publications/Archive/R.20021002.MTR/R.20021002.MTR.pdf> (accessed 12 March 2010).

Krepinevich, Andrew F. *Why Air-Sea Battle?* Washington, DC: Center for Strategic and Budgetary Assessments, 2010. http://www.csbaonline.org/4Publications/PubLibrary/R.20100219.Why_Air-Sea_Battle/R.20100219.Why_Air-Sea_Battle.pdf (accessed 22 February 2010).

Murray, Williamson and Allan R. Millett, eds. *Military Innovation in the Interwar Period*. Cambridge, UK: Cambridge University Press, 1996.

O'Halloran, James C. and Christopher F. Foss, eds. *Jane's Land Based Air Defence*. Coulsdon, UK: Sentinel House, 2008-2009.

Salameh, Mamdouh G. *China's Global Oil Diplomacy: Benign or Hostile?* Cleveland, OH: International Association for Energy Economics, First Quarter 2010. <http://www.iaee.org/documents/2010WinterEnergyForum.pdf> (accessed 17 April 2010).

Simonson, G.R., ed. *The History of the American Aircraft Industry: An Anthology*. Cambridge, MA: The Massachusetts Institute of Technology Press, 1968.

Talmadge, Eric. *USA Today*. "US Official Notes China's Military Gains," 29 September 2007. http://www.usatoday.com/news/world/2007-09-29-3112601973_x.htm (accessed 27 April 2010).

Toukan, Abdullah and Anthony H. Cordesman. *Study on a Possible Israeli Strike on Iran's Nuclear Development Facilities*. Washington, DC: Center for Strategic and International Studies, 14 March 2009. http://csis.org/files/media/csis/pubs/090316_israelistrikeiran.pdf (accessed 23 March 2010).

U.S. Department of Defense. *Annual Report to Congress: Military Power of the People's Republic of China*. Washington, DC: Department of Defense, 2009. http://www.defense.gov/pubs/pdfs/China_Military_Power_Report_2009.pdf (accessed 23 February 2010).

U.S. Department of Defense. *National Defense Strategy*. Washington, DC: Department of Defense, June 2008.

<http://www.defense.gov/news/2008%20national%20defense%20strategy.pdf>
(accessed 18 Jun 2010).

U.S. Department of Defense. *Report of the Defense Science Board Task Force on Strategic Mobility*. Washington, DC: Office of the Under Secretary of Defense for Acquisition and Technology, August 1996. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA316992&Location=U2&doc=GetTRDoc.pdf> (accessed 12 Mar 2010).

U.S. Department of Defense. Report of the National Defense Panel. Washington, DC: Department of Defense, December 1997. <http://www.dtic.mil/ndp/FullDoc2.pdf>
(accessed 12 Mar 2010).

U.S. Department of Defense. *Quadrennial Defense Review Report*. Washington, DC: Department of Defense, February 2010.

U.S. Naval War College, Joint Military Operations Department. *PRC-Taiwan Vignette*, 2010.

U.S. Office of the Chairman of the Joint Chiefs of Staff. *Joint Operations*. Joint Publication (JP) 3-0, Change 1. Washington, DC: CJCS, 13 February 2008.

Vego, Milan. “Military Objectives and the Levels of War,” *Joint Operational Warfare*. Newport, RI: Naval War College, reprint, 2009. Pgs. II-10-12.

Vego, Milan. “The Factor of Space,” *Joint Operational Warfare*. Newport, RI: Naval War College, reprint, 2009. Pgs. III-7, 10-11, 15.

Washington Times. “China Sub Stalked U.S. Fleet,” 13 November 2006.

<http://www.washingtontimes.com/news/2006/nov/13/20061113-121539-3317r/>
(accessed 23 February 10).

Wilke, Robert. “Hybrid Warfare: Something Old, Not Something New.” *Air and Space Power Journal*, Volume XXIII, No. 4. (Winter 2009): 13-17.